

IN THE CLAIMS:

The following is a complete listing of the claims. Please amend the claims as follows:

1-21. **(Cancelled).**

22. A method of bonding at least two composite preforms together comprising the steps of:

providing at least two composite preforms, each composite preform having composite fibers extending generally in an X-Y plane;

inserting discrete fibers through each preform generally in a Z direction, so as to form exposed Z-direction fibers and loops protruding outward from each preform;

overlapping the exposed Z-direction fibers and loops from one preform with the exposed Z-direction fibers and loops from another preform;

infusing a resin material through each preform and the overlapped Z-direction fibers and loops;

co-curing the preforms, thereby bonding the preforms together.

23. The method according to claim 22, wherein the discrete fibers are fiberglass.

24. The method according to claim 23, wherein the fiberglass discrete fibers are S-glass discrete fibers.

25. The method according to claim 22, wherein the discrete fibers are graphite.

26. The method according to claim 22, wherein the discrete fibers are polymers.

27. A method of bonding two composite preforms together comprising the steps of:

providing at least two composite preforms, each composite preform having composite fibers extending generally in an X-Y plane;

associating a layer of soluble material with each of the preforms;

inserting discrete fibers through each preform and each layer of soluble material generally in a Z direction, so as to form Z-direction fibers and loops protruding outward from each preform into the soluble material;

infusing a resin material into each preform;

preventing the resin material from wicking into the Z-direction fibers and loops with the soluble material;

curing each preform;

removing the soluble material from each cured preform to expose the Z-direction fibers and loops;

overlapping the exposed Z-direction fibers and loops from one preform with the exposed Z-direction fibers and loops from another preform; and

bonding the preforms together by disposing an adhesive material in the overlapped exposed Z-direction fibers and loops.

28. The method according to claim 27, wherein the discrete fibers are fiberglass.

29. **(Cancelled).**

30. **(Cancelled).**

31. **(Cancelled).**

32. The method according to claim 27, wherein prepregs are substituted for preforms.

33. The method according to claim 27, wherein a meltable material is substituted for the soluble material.

34. The method according to claim 33, wherein the meltable material is thermoplastic.

35. An apparatus for reinforcing in a Z direction a composite preform having composite fibers in an X-Y direction comprising:

a base plate having a lower array of needle apertures;

a middle plate disposed above the base plate, the middle plate having an aperture for retaining a volume of discrete fibers, the base plate and the middle plate being adapted to receive the preform therebetween;

a top plate disposed above the middle plate, the top plate having an upper array of needle apertures;

a needle bank for holding a plurality of barbed needles; and

a reciprocating device for repeatedly pushing the needles through the upper array of needle apertures, the volume of discrete fibers, and the lower array of needle apertures;

wherein the discrete fibers are inserted through the preform generally in the Z direction so as to provide reinforcement in the Z direction.

36. The apparatus according to claim 35, wherein the discrete fibers are fiberglass.

37. The apparatus according to claim 36, wherein the fiberglass discrete fibers are S-glass discrete fibers.

38. The apparatus according to claim 35, wherein the discrete fibers are graphite.

39. The apparatus according to claim 35, wherein the discrete fibers are polymers.

40. The apparatus according to claim 35, further comprising:

a resilient material disposed between the base plate and the middle plate for providing support for the preform and for retaining the discrete fibers after the discrete fibers have been pushed through the preform.

41. The apparatus according to claim 40, wherein a soluble material is substituted for the resilient material.

42. The apparatus according to claim 40, wherein a meltable material is substituted for the resilient material.

43. The apparatus according to claim 42, wherein the meltable material is thermoplastic.

44. The apparatus according to claim 35, further comprising:
at least one guide rail for guiding and stabilizing the reciprocating device.